

CLAIMS

1. A membrane segment for use in surgically treating a segment of damaged cartilage in a mammalian joint, comprising a membrane segment which is porous and hydrophilic and which is permeable to water and to low molecular weight nutrients that are present in mammalian synovial fluid, but which is not permeable to surface-active phospholipids, wherein the membrane segment:

a. is maintained during storage and shipping in a sealed package which ensures sterility of the membrane until use in a surgical procedure;

b. is suited in all respects for implantation into a mammalian joint in a surgical procedure;

c. allows permeation of water and nutrients into cartilage tissue which underlies the membrane segment following surgical implantation; and,

d. has an anchoring surface suited for placement in direct contact with a condyle, and a second opposed surface which will remain exposed as an articulating surface after the membrane segment has been anchored to a bone,

wherein the articulating surface has a pore structure which causes the membrane segment to interact with hyaluronate molecules and surface-active phospholipid molecules in mammalian synovial fluid, in a manner which (i) prevents permeation of the hyaluronate molecules and surface-active phospholipid molecules through the membrane segment; (ii) prevents clogging of pores in the articulating surface by hyaluronate molecules or surface-active phospholipid molecules; and (iii) sustains proper lubrication of the articulating surface of the membrane segment by synovial fluids, when compressive forces are imposed on the mammalian joint.

2. The membrane segment of Claim 1, wherein the membrane

segment is affixed to a resorbable implantable scaffold which supports chondrocyte cell growth and cartilage secretion when anchored to a bone or cartilage surface.

3. The membrane segment of Claim 1, wherein the membrane segment is designed to be trimmed to a desired size and shape and then secured directly onto a damaged surface area on a segment of native cartilage.

4. The membrane segment of Claim 1, wherein the membrane segment comprises collagen fibers.

5. The membrane segment of Claim 1, wherein the membrane segment comprises a synthetic polymer.

6. The membrane segment of Claim 1, wherein the membrane segment comprises a copolymeric blend of poly-vinyl alcohol and poly-vinyl pyrrolidone.

7. The membrane segment of Claim 1, which also contains fibers that extend outwardly from the anchoring surface and which promote secure attachment of the membrane to an underlying surface.

8. The membrane segment of Claim 1, which is created by steps comprising surface treatment of a thick permeable material in a manner which creates a toughened surface layer.

9. A method of repairing a cartilage defect in an articulating joint, comprising surgical implantation of a membrane segment of Claim 1 onto a cartilage defect surface area in the joint.

10. The method of Claim 9, wherein the membrane segment is seeded with cartilage-secreting cells or stem cells prior to surgical implantation.

11. The method of Claim 9, wherein the device is seeded with cartilage-secreting cells or stem cells during a surgical implantation procedure.

12. A membrane segment for use in surgically treating an internal organ in conjunction with a resorbable cell-growing matrix, comprising a membrane segment which is porous and hydrophilic and which is permeable to water and to low molecular weight nutrients dissolved in water, wherein the membrane segment:

a. is maintained during storage and shipping in a sealed package which ensures sterility of the membrane until use in a surgical procedure;

b. is suited in all respects for implantation into a mammalian body in a surgical procedure;

c. has little or no permeability to biological compounds having a molecular weight greater than about 5000 daltons;

d. has an anchoring surface suited for direct contact with a resorbable cell-growing matrix that can be seeded with viable cells, and a second opposed surface which will remain internally exposed, on a surface of an internal organ, after the resorbable cell-growing matrix has been implanted in a body.

13. A resorbable cell-growing matrix for use in surgically treating an internal organ, wherein at least one surface of the resorbable cell-growing matrix is covered by a membrane segment which is porous and hydrophilic and which is permeable to water and to low molecular weight nutrients dissolved in water.